Robotics and Work: labor and tax regulatory framework[1]

María Yolanda SÁNCHEZ-URÁN AZAÑA, Full Professor in Labor and Social Security Law, Complutense University, Madrid, Spain sanuran@ucm.es

María Amparo GRAU RUIZ, Professor in Financial and Tax Law, Complutense University, Madrid, Spain, grauruiz@ucm.es

Abstract:

Considering the risks and opportunities created by the latest developments in advanced robotics, we reflect on the social dimension of this phenomenon and, based on ethics, we analyze some legal aspects. In particular, and taking into account the effects of robotics on the labor market, sustainable legal solutions are proposed and progress is made in the principle of socially and legally responsible robotic innovation, in the field of labor relations and in the adoption of tax and fiscal measures applicable in relation to robots.

Keywords: Robotics, Taxation, Employment, Roboethics, Social Protection, Universal Basic Income

Summary:

[1] CertificaRSE Project, DER 2015-65374-R (MINECO-FEDER); and INBOTS CSA Project, *Inclusive Robotics for a better Society*, Program H2020-ICT-2017-1; Project No. 780073, http://inbots.eu/

Preliminary Version the Proceedings of the International Congress TECHNOLOGICAL INNOVATION AND FUTURE OF WORK, Santiago de Compostela, 5th and 6th april , 2018

I. Introduction

A reflection on the labor law and financial implications of Robotics must start with the technological context that is described today as the 4th Industrial Revolution, which is more than a simple description of change driven by technology.

We jurists are obliged to comprehend the phenomenon. First, to understand, define and delimit it; then to explain and analyze it; and lastly to propose fair and equitable step-by-step solutions, because this global concept encompasses multiple realities, each with their own characteristics and their particular impact. Of particular complexity are the impacts of the technologies on working life as a source of personal identity.

Thus, for example, we speak of Artificial Intelligence (AI) as a set of technologies devoted to replicating in machines cognitive processes that are similar to those in humans, in order to enable the former to learn and adapt on their own to a specific environment (*FTI Consulting Report*). Or as 'the ability of computer programs to produce results from reasoning equivalent to those obtained by natural human intelligence by means of artificial learning systems that are similar to natural ones' [2]. And this differs from Robotics in that Robots may or may not be equipped with AI.

It is true that deep down there is a common element or feature that concerns society in general, social scientists, and especially jurists from different areas of research: that of the social dimension of this phenomenon and the necessary intergenerational responsibility, particularly the interrelationship between technological change, economic performance and employment.

On the one hand, the impact of these technological manifestations on free, personal human work or employment; in its configuration and definition and in the

[2] Agote Eguizábal, R.: 'Inteligencia Artificial, Ser humano y Derecho', *Review Claves de Razón Práctica*, no. 237, 2018, p. 41

The Communication from the Commission, 'Artificial Intelligence for Europe', Brussels 24.4.2018, COM (2018)237 describs AI: 'Artificial intelligence (AI) refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals. AI-based systems can be purely software-based, acting in the virtual world (e.g. voice assistants, image analysis software, search engines, speech and face recognition systems) or AI can be embedded in hardware devices (e.g. advanced robots, autonomous cars, drones or Internet of Things applications)'.

different models or forms of work, profoundly altered today by automation or digitalization, globalization and the increase in productivity of a small number of highly qualified professionals, and the impact on labor relations, i.e. on the conditions in which the worker provides services, should be analysed. On the other hand, the practical effect of sound financial and tax regulations is common knowledge, especially in the pursuit of non-fiscal goals.

In order to analyze the subject in depth, particularly the impact of Robotics on Labor Law and Financial Law, we must start with some reflections raised by Ethics (Part 2); attempt to adopt a concept of Robots and lay the foundations for legal regulation (Part 3); and lastly, resolve a number of issues which, from the perspective of these disciplines, are posed by the robotization of the labor market (Parts 4 and 5).

II. Ethics, Law and Inclusive Robotics

Law needs Ethics as a foundation for its rules and Ethics needs Law to give more force to its conclusions. Roboethics, understood as the set of criteria or theories, which are formulated as a response to the ethical problems arising from the design, creation, development and use of robots[3], warns us that Robotics gives rise to unique issues that go beyond those which are common to all the so-called 'emerging technologies'. These include the relationship or interaction between human beings and machines (uses and limits of robotics) and the moral status of robots, i.e. their possible consideration as moral agents. There is also debate as to whether, when robots possess certain characteristics, which make them similar to humans, they cease to be an object and can be considered a subject[4]. Robotics presents several issues or problems that affect its political and legal implications. On the one hand, these implications should guide public authorities in their job to oversee the introduction of robots in a socially responsible manner; in such a way that society perceives that they are necessary and useful to people and are accepted by them. On the other hand, they should facilitate a

[3] Veruggio, G.: *The EURON Roboethics Roadmap*, 2006, available at: http://www3.nd.edu/~rbarger/ethics-roadmap.pdf.

Also, Veruggio, G. and Operto, F.: 'Roboethics: Social and Ethical Implications of Robotics', in *Handbook of Robotics*, Siciliano, B. and Khatib, O. (eds.), 2008. By the same authors: 'Roboethics: a bottom-up interdisciplinary discourse in the field of applied ethics in robotics', *International Review of Information Ethics*, Vol. 6, No. 12, 2006, pp.2-9.

[4] De Asís, R.: *Una mirada a la Robótica desde los Derechos Humanos*, Edit. Dykinson, 2014, pp. 41-43, 74, 75.

situation whereby those authorities and the many groups with a social and economic stake in the matter can work towards legislation, which addresses not so much (or not only) the specific characteristics intrinsic to robots but the type of problems they pose.

As part of the process of eliminating existing barriers, the need to legally regulate robotics is obvious, although there is no unanimous position as regards the manner and scope of that regulation because there is, as yet, no common position regarding the ethical framework required to deal with the challenges posed by robotics. Whether we follow the path of regulation, which we can call *hard law*, or whether we opt for the path of *soft law,* in both cases we need to ensure transparency and accountability regarding the social and economic costs and benefits.

And should the path of mandatory regulation be the one finally chosen, it will be necessary to bear in mind not only the multiplicity of technological applications but also the range of legal problems they generate and the difficulty of fitting them all into a uniform paradigm. That is why approaches which until recently were different, those of the United States (CALO et al.[5]) and Europe (PALMERINI et al.[6]), can now come together around regulations or minimum mandatory rules that establish the necessary balance between facilitating robotic technological development and protecting the values desired by humans. National reports in various countries, some in the general context of digitalization, others related more specifically to Artificial Intelligence, and others relating even more specifically to Robotics in connection with AI (e.g. Economic and Social Council in Spain; Italy; France; United States; Great Britain; and Japan) stress the interaction between robotics and human being and the social impact thereof by reminding us that 'we are creating systems to help us; we are not creating life'[7].

For this reason, the response to issues relating to when the Law should intervene, how to intervene, and what form of regulation would be necessary, requires that we not

[5] Calo, R., Froomkin, A.M. and Kerr, I. (Eds): *Robot Law*, EE Elgar, 2016; CALO, R. described Robots some time ago as 'entities' and consider them to be artificially intelligent devices with 'cognitive' faculties, in Calo, R.: 'La robótica y las lecciones del Derecho cibernético', *Review Privacidad y Derecho Digital*, núm.2, 2016, pp.155-157.

[6] Palmerini, E.: 'Robótica y Derecho: sugerencias, confluencias, evoluciones en el marco de una investigación europea', *Review de Derecho Privado,* Universidad Externado de Colombia, n.° 32, January-June de 2017, p. 80; Leenes, R., Palmerini, E., Koops, B.J., Bertolini, A., Salvini, P. and Lucivero, F.: 'Regulatory challenges of robotics: some guidelines for addressing legal and ethical issues' , Journal *Law, Innovation and Technology,*, 2017, Vol. 9, No. 1, 1-44, p.12.

[7] As discussed in Nisa Ávila, J.A.: .: 'Robótica e Inteligencia Artificial ¿legislación social o nuevo ordenamiento jurídico', El Derecho.com, Lefebvre, 2016, http://tecnologia.elderecho.com/tecnologia/internet_y_tecnologia/Robotica-Inteligencia-Artificial-legislacion-social-nuevo-ordenamiento_11_935305005.html, (consulted in March 2018).

only take into account the specificity of the context (in particular the different characteristics of robots, especially when they are endowed with systems of AI), but, above all, that we precisely identify the significant challenges arising from the profound underlying problems. In order for the Law to be able to adopt measures in this regard, we need to clearly define the problem and the challenges that have to be addressed, based on the set of common general principles in the acquis of the European Union (which help to construct what has started to be called 'fully-fledged digital citizenship'[8]). Today the framework of the European Pillar of Social Rights pays special attention to human abilities. Those abilities that are affected by robots and those that, though it may seem paradoxical, can be fostered by robots so that people can devote themselves to performing activities that can be described as inherently human, i.e. those related to characteristics associated with humans such as emotions, awareness, reflection, abstract processing, personality and free will. It is a question of moving forward on the basis of what technology has called 'the principle of caution'[9] as applied to freedom of scientific investigation and, beyond rules of 'technological neutrality'[10] (which cannot become an end in itself), to implement the principle of socially and legally responsible technological innovation.

Whether we talk of 'Robot Law'[11] or 'Robotics Law' or whether we consider this to be a branch of the broader Digital Law, the first issue to resolve (to define both the object and subject) is that which concerns the characterization and classification of robots**.** We can take a specific technical definition (the one provided by the *Industrial Federation of Robotics*, IFR) as a starting point; move forward towards a more general technical definition; and conclude that the characteristics which define robots are autonomy, corporeality and intense physical and/or cognitive interaction with humans. Hence an initial distinction can be made between CoBots (mainly interactive in industrial and manufacturing sectors) and Inclusive Robots (predominantly interactive in services sector and others, i.e, healthcare). Characteristics which have been described

[8] Cortina, A.: 'Ciudadanía digital y dignidad humana', opinion article in *El País*, 26 March 2018, which considers it to be a fair and essential requirement that digital citizenship be at the service of autonomous and vulnerable people.

[9] 'Which supports the adoption of protective measures with regarding to certain products or technologies which are suspected of posing a serious risk even though there is no scientific proof of this', De Asís, R.: *Una mirada a la Robótica…, cit*., p. 68.

[10] Leenes R., et al.: 'Regulatory challenges of robotics…', cit., p.12.

[11] Barrio Andrés, M. (Ed.): *Derecho de los Robots*; Edit. La Ley, Wolters Kluwer, 2018.

as: the ability to gather data via sensors; to process raw data; to plan and perform actions by means of knowledge and information acquired, generally, on the basis of pre-established objectives (described as *sense-think-act*). While bearing in mind that the following are also occasional characteristics: the ability to communicate with an operator, with other robots or with an external network; and the ability to learn.[12] Conversely, the existence of life in a biological sense would never be a characteristic of a robot.[13]

As people enablers (so that individuals can devote themselves to developing abilities inherent to human beings), whether they be *CoBots* or *Inclusive Robots* (which share the characteristics indicated previously, especially autonomy, corporeality and physical and/or cognitive interaction with human beings), what is now being called 'botsourcing' (the replacement of human jobs by robots) can have a positive effect on the labor market, as analyzed below.

III. Labor Law implications of Robotics

One of the fundamental problems posed by robotics is its effect on the labor market and this reflection encompasses the challenges posed by technology in general, and automation in particular, in the world of work.[14]

From this perspective, studies and reports have adopted varying approaches. Two expressions have become generalized: techno-pessimism[15], which identifies the

[12] García-Prieto Cuesta, J. '¿Qué es un Robot?, in Barrio Andrés, M. (dir.): *Derecho de los Robots*, cit., p.38, describes a robot as 'a machine, endowed with a certain complexity both in its components and its design or in its behaviour, which manipulates information about its environment in order to interact with it'.

[13] Richards, N.M. and Smart, D.: 'How should the law….', cit., p.6. They describe robot as 'a constructed system that displays both physical and mental agency, but is not alive in the biological sense'.

[14] From ILO, Nieto, J.: 'El futuro del trabajo que queremos y el Derecho del Trabajo', in *Ius Labor* 3/2017, https://www.upf.edu/documents/3885005/140470042/1.+Editorial.pdf/406c3008-6ef9-7ed6-f4ee-8f754c9adc31 (last access March 2018).

The ILO Initiative for the Future of Work can be consulted in http://www.ilo.org/global/topics/future-of-work/lang--es/index.htm; And the national syntheses in http://www.ilo.org/global/topics/future-of-work/WCMS_591507/lang--es/index.htm.

[15] For example, from USA, Acemoglu, D. and Restrepo, P.: 'Robots and Jobs: Evidence from US Labor Market', *NBER Working Paper* No. 23285, 2017, in http://www.nber.org/papers/w23285 (last access March 2018); also, Frey, C.B. and Osborne, M.A.: 'The Future of Employment: How susceptible are Jobs to computerisation', *Technological Forecasting and Social Change*, Vol. 114, No. C, 2013, pp. 254-280, which analyses 702 jobs and claims that 47% of jobs in the U.S. are at risk of being computerized or robotized.

risks posed by robotics to employment and concludes with a drastic prediction of job disruption or destruction; and techno-optimism (Mckinsey Global Institute, 2017; PwC, 2018), which identifies the challenges and opportunities presented by the robotization of the labor market.

In any event, we should bear in mind that the studies are carried out in a socio-economic context of employment precariousness (we speak of 'the precarious' in sociological and economic terms[16] as an emerging social class which lives in a state of economic and professional insecurity), together with a high level of unemployment, and in a demographic context of an aging population and high levels of life expectancy.

In spite of all this, the fundamental question is whether the increase in company productivity and competitivity (which does not appear to be in doubt) will also be accompanied by an increase in the quantity and quality of human employment. And in this respect, apart from the 'replacement' effect, problems arise in relation to the transitional period we are still going through, including those which affect the working conditions of humans: pressure on salaries, particularly on those of less skilled workers; the move towards decentralized production; the reallocation of jobs and tasks; and the effect of technological unemployment.

There is no snapshot available that covers all sectors, all kinds of work, every skill level, all markets or all countries[17]. Therefore:

- The analysis requires a temporal perspective, but should avoid making long-term projections exclusively. We need to promote a situation in which the absence of constraints on technological innovation goes hand in hand with the principle that automation and robotics must permit employment to be focused on 'jobs that add greater value'; this means committing ourselves now to the development of technological competences and balancing the two needs, one

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The projections of these authors are used in the 2018 BBVA report; Doménech, R. et al.: How vulnerable is employment in Spain to the digital revolution?

https://www.bbvaresearch.com/wp-content/uploads/2018/03/Cuan-vulnerable-es-el-empleo-en-Espana-a-la-revolucion-digital.pdf (last access March 2018)

[16] Standing, G.: *The Precarious: a new social class*, Edit. Pasado y Presente, 2013, Barcelona, 2013. Founder of the Basic Income Earth Network that postulates universal basic income.

[17] United Nations: *Trade and Development Report*, 2017; in particular, Chapter III, *Robots, Industrialization and Inclusive Growth*: 'This discussion shows that disruptive technologies always bring a mix of benefits and risks. But whatever the impacts, the final outcomes for employment and inclusiveness are shaped by policies'; p.60.

which stems from growth and competitivity, and consequently the adoption of technology, and the other which minimizes disruption in the labor market to prevent social inequalities.

- The digital breach and the associated social cost must be dealt with, paying special attention to the vulnerability of certain groups (based, among other factors, on gender and age).

- A 'safety net' for the transition period is required, and it demands the proposal of related political and legislative measures.

To solve these problems, is it necessary to make changes to the Labor Law (and also the Social Security Law), i.e. in the regulatory framework of labor relations in the robotized neo-technological context? The answer must take into account the multi-functionality of the legal definition of robots (autonomy, physical configuration and ability to interact with workers[18]), and the involvement of entrepreneurs and workers' representatives, especially trade unions, in order to take decisions, which are based on consensus between them and accepted by the public authorities. Lastly, a minimum, albeit necessary, mandatory legal intervention is needed to ensure a balance between entrepreneurial freedom and the function and purpose of Labor Law, especially with regard to the protection and guarantee of human work. This last part affects two areas: the concept of 'worker' and forms of employment in the robotized labor market (1); and the working conditions (2). And, for both these, we need to reflect urgently on some of the problems and the possible legal solutions in the transition phase.

1. Concept of worker and forms of employment in the robotized labor market

Let us pose these issues in question form and briefly indicate a solution:

1. Impact on the concept of salaried employee? There is no direct reconsideration; however (especially as regards the solution to the problem of liability for damages) it could indirectly affect 'Labor Law evasion'.

[18] Del Rey Guanter, S.: *Robótica y su impacto en los Recursos Humanos y en el marco regulatorio de las Relaciones Laborales*, Edit.Wolter Kluwer, 2018, Chapter 3, describes these elements in the following way: autonomy, acquired by means of sensors and/or data sharing and analysis (interconnectivity); physical configuration, i.e. a minimum physical materialization, which entails the possibility of physical movement applied to the work, with the possibility of total or partial displacement; interaction with the environment with reponse capability by means of the appropriate programming.

2. Reconsideration of the concept of disabled worker? The concept of disability may change in the future and this means it will be necessary to rethink the legal concept of occupational integration based on the distinction between therapy and the improvement of capabilities.

3. Due to the replacement effect, will there be a change in the traditional forms of work, whether the person has an employment contract or is self-employed? Contractual diversity should be maintained, although it should be committed to guaranteeing social, economic and labor rights, i.e. by adopting measures to prevent and correct regressive segregation. It is precisely this which is, or should be, a priority of the regulatory framework of labor relations in this phase of robotization for the purpose of preventing worker polarization, or digital polarization as a synonym for precarious employment, even if it is necessary to accept a new division of labor, between digital labor and human labor.

4. As far as '*robot workers*' are concerned, electronic personality or Impersonal Capable Entities (the original Spanish term is *Entes Capaces No Personales*, ECNP)[19]? Labor Law allows us to take a critical position regarding a robotic personality or ECNP, i.e. regarding legal recognition of a new category of capable subjects or entities, and even more so when it comes to defining a relationship, such as a labor relationship, which is both proprietary and personal in nature, an exchange which is permanent and stable, and above all, voluntary. Voluntariness and awareness are something that robots will never achieve, even if they are endowed with AI.

5. If this was the case, could they have employment status? For this to be possible we would have to stop considering them as a mere instrument of work and start to consider them as technologically complex tools. They would not, however, be subject to labor rights and obligations due to the absence of the characteristic of 'voluntariness'.

6. With regard to the change in the model of work and the polarization of workers, we would counteract the digital breach (and the effects thereof on specific groups of workers) by means of actions and measures geared towards safeguarding the

[19] García Mexía, P.: 'Entes Capaces No Personales. ¿Hacia una personalidad para los robots', in https://www.automatas.tech/pablo-garcia-mexia-colaboracion.html (last access March 2018).

distribution of work and the protection of the most vulnerable workers within the framework of the principle of equality and non-discrimination in employment. Would it be necessary to go further in the principle of *equality and robotic non-discrimination*, which would also require, as preventive and corrective measures, the implementation of rules on positive or affirmative action in favor of human workers? This would require us to address the following issues, among others:

- A 'human quota' in companies? A measure which could be implemented in the transition period on an exceptional, extraordinary and temporary basis.

- Financial incentives for entrepreneurs? Incentives for retraining and relocating workers could be adopted.

- Technological requirements during the selection process, i.e. can these conditions or the technological adaptability (robotics) of the workers be used as selection criteria? This means considering whether the assessment of such requirements in the framework of the right to equality and non-discrimination should be applied restrictively during the transition period and progressively extended for companies which exhibit a high level of robotization in their production processes or in those which are immersed in a process of robotization.

2. ***Working conditions and the impact of Robotics***

There are two aspects to be analyzed here: one is related to the 'replacement effect' of robotics; the other is related to collaborative or cooperative work with robots.

If we analyze the impact of robotics from a negative perspective, i.e. the replacement of the human workforce by robots (botsourcing[20]), and if we maintain that this effect will be inevitable in the short term, it is worth considering whether or not robotics is a technological phenomenon which impacts on the right to non-discrimination in terms of working conditions, the main legal 'safety net' for workers. And this, in our opinion, allows us to assess not only arbitrary behavior on the part of entrepreneurs but also those forms of behavior which can, 'aseptically', be considered as linked to an entrepreneurial right to technological-robotic innovation in the company. If this impacts on certain groups of workers for reasons which include gender and age, robotization could be considered as a cause of indirect discrimination (with robotization

[20] Waytz, A. and Norton, M.I.: 'Botsourcing and Outsourcing: Robot, British, Chinese, and German Workers Are for Thinking - Not Feeling - Jobs', *Emotion,* 2014, No. 2, pp. 434 – 444.

being identified as a neutral criterion which has or can have an adverse impact on, or prove detrimental to, one of the vulnerable groups identified for one of the causes where discrimination is prohibited) and would activate the guarantee process provided for in EU regulations, particularly Directive 2000/78.

This leads us immediately to analyze the 'technical cause', arising from robotization, in such a way that measures are devised which are geared towards workers' remuneration (which is none other than the effective and real application of the right to equal pay for equal work; *human work as work of equal value to that of the robot*). And also in relation to eliminating vacant positions (or dismissals or job changes) arising from robotization.

From this latter perspective, we need to analyze *botsourcing* and its labor implications, bearing in mind that the robot is, or can be considered to be, a 'technical improvement' in the company, which affects aspects of internal and external flexibility. This will require the legislator to specify, at the regulatory level, the technical reason arising from robotization (in the sense of a massive incorporation of robots and replacement of workers); the implementation of well-thought out and balanced measures which limit the impact of dismissal (need for preventive measures, prior to termination, and immediate corrective measures, need to relocate the worker affected). As far as the preventive measures are concerned, one of the issues posed in this respect is the definition of 'reasonable adjustment' as regards the necessary readjustment of the job of the worker who has been replaced by robots with the subsequent problem of whether these adjustments can be considered an 'excessive burden' for the entrepreneur. In our opinion, it would be necessary to assess the reasonableness or otherwise of the adjustment in relation to tax incentives and subsidies for innovation which have been granted to entrepreneurs. And, lastly, a highly controversial aspect is the issue of 'auxiliary aids', particularly the use exoskeletons which able-bodied people could request of entrepreneurs in order to improve their personal skills[21].

If we analyze the perspective of collaboration, cooperation, interaction of human workers and robots, a number of issues arise, particularly in connection with:

[21] Hoder, C. et al.: 'Robotics and law: Key legal and regulatory implications of the robotics age (part II of II)', C*omputer law & Security Review*, No. 32, 2016, pp. 557–576

- Health and safety at work, new psychosocial risks, professional retraining of workers and working time (assessment of the digital disconnection of the robots and its influence on pay and the calculation of working time).

- The worker's right to privacy and, in particular, 'robotic' surveillance.

- Intellectual property rights/patent right when the worker 'trains' the robot.

- Advanced perspective of entrepreneurial secrecy (Spanish draft bill).

IV. Financial and Tax Law Implications Of Robotics

There is an obvious need to adapt the financial and tax rules to face the legal, economic, ethical and social challenges posed by robotics[22]. This process of adaptation has just begun and will have to be maintained in the future. Apparently, as a machine includes new functions -similar to human capabilities, it is referred to as 'robot'; once we differentiate them from the ones attributable to humans, it is called again 'machine'[23]. As a consequence, those functions, for the purpose of our study, may help to dynamically define a job.

In this changing environment, an interactive robot (with different levels of complexity) may supplement or substitute a human being for the development of some tasks[24]. In the coming years, the economy and the appearance of various jobs will possibly experience alterations, particularly regarding the remuneration and/or the number of required personnel in a specific field. Hence, the design of new public policies will surely have an impact on the financial legal order; and conversely the latter will probably impose restrictions of the formers' feasibility, in the light of the expected qualitative and quantitative transformations[25].

Undoubtedly the types of work have been changing along History hitherto. From now on, the degree of robots penetration may be gradually increased in a given job

[22] Grau Ruiz, M.A.: 'La adaptación de la fiscalidad ante los retos jurídicos, económicos, éticos y sociales planteados por la robótica', *Nueva fiscalidad*, No. 4, 2017, p. 35.

[23] Professor Bernard Roth elaborated this variable concept at Stanford. García-Prieto Cuesta, J. '¿Qué es un robot?' (Chapter I), in Barrio Andrés, M. (dir.): *Derecho de los robots*, La Ley-Wolters Kluwer, 2018, p. 33.

[24] García-Prieto Cuesta, J.: '¿Qué es un robot?', cit., p. 39.

[25] Froomkin, A.M.: 'Prologue', in Barrio Andrés, M. (dir.): *Derecho de los robots*, La Ley-Wolters Kluwer, 2018, p. 22.

(considering the total, partial or nil reservation of some tasks for human participation). As the use of robotics in our society evolves, the legislation will have to consider how individuals and companies use robots[26].

Nowadays, the world trends already show a continued proliferation in the use of robots[27]. In this context, many questions arise: should taxation intervene to slow down the spread use of robots, or to finance new labour opportunities? Should the companies that invest in robots substituting workers pay taxes and Social Security contributions for the benefits obtained due to the increase of productivity?[28] Which would be the competent authority to receive those payments? In the case where several States are involved, because the robot interface may act in a multiple off-line real (on top of virtual) environment, these States will have to cooperate in the design of coherent measures to safeguard social protection, taking advantage of the pace and volume of information flowing across borders.

The main issue, in the middle of this digital revolution, is how to allocate rights and responsibilities among human beings for the actions of no-human beings, fighting inter-personal and inter-national inequality (as intellectual and financial capital providers are supposed to enjoy the greater benefits)[29].

The risks of job destruction and structural unemployment have propitiated the discussions around the universal basic income[30]. The International Monetary Fund (IMF) states that this instrument allows facing the acceleration of the decline in income and the uncertainty due to the impact of the technological evolution on the employment. However, there are doubts regarding the affordability and its costs, if they are displacing other priority expenditure programs that actually promote inclusive growth.

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[26] Barrio Andrés, M.: 'Del Derecho de Internet al Derecho de los robots', in Barrio Andrés, M. (dir.): *Derecho de los robots*, La Ley-Wolters Kluwer, 2018, pp. 71-73

[27] Available at https://ifr.org/news/world-robotics-survey-service-robots-are-conquering-the-world-/ (last access 1 April 2018)

[28] Segura Alastrué, M.: 'Los robots en el Derecho Financiero y Tributario' (Chapter VII), in Barrio Andrés, M. (dir.): *Derecho de los robots*, La Ley-Wolters Kluwer, 2018, p. 173.

[29] Gupta, S.; Keen, M.; Shah, A.; Verdier, G. (eds.): *Digital revolutions in public finance*, International Monetary Fund, Washington DC, November 2017, pp. 11-12. Available at http://www.elibrary.imf.org/view/IMF071/24304-9781484315224/24304-9781484315224/Other_formats/Source_PDF/24304-9781484316719.pdf (last access 1 April 2018).

[30] No country has approved a UBI for the entire population to date. International Monetary Fund: 'Tackling Inequality', *IMF Fiscal Monitor*, October 2017, p. 3-4. Executive summary available at http://www.imf.org/en/Publications/FM/Issues/2017/10/05/fiscal-monitor-october-2017 (last access 1 April 2018).

Additionally, some critics argue that separating this income from the participation in the workforce would be problematic.

A number of experiments, considering distinct features of the universal basic income, are being carried out by the private and the public sector, to find out its impact on the individual and the society[31]. This movement may be understood as an extension of the Social Security network, an alternative to bureaucracy and public intervention, or a manner to maintain social peace. Evidently, behind the supporters of universal basic income one may find completely different views, but they all face the same problem: how to finance it? [32] For instance, in Switzerland the proposal of universal basic income was rejected by citizenship because of its costs, among other reasons[33].

Clearly, the way to finance this measure will influence its net redistributive impact. The IMF has recently declared that the possibility to replace the current system of social protection with a basic universal income will depend on the performance of that system, the governmental administrative capacity and the prospects to improve targeting. Presently, in developed countries, it seems preferable to reinforce the existing systems, directly eliminating the gaps in the coverage nets -caused by the participation rules or the incomplete take-up, and pay attention to the proper design of salary subsidies to incentivise the work of low-income workers.

The IMF has recognised that a sound motivation to adopt a universal basic income could be 'enhancing income insurance in the context of rising job insecurity due to technological change and automation or building public and political support for structural reforms, such as eliminating food or energy subsidies and broadening the consumption tax base'[34].

[31] E.g. 'Y Combinator' in San Francisco, or Canada (Ontario), Finland and the Netherlands.

[32] A 70% of Finnish say that they are in favour of a basic income, however this percentage is 35% when they are told that taxes would be raised to finance it. As the cost of the experiment is limited to 20 million euros, it is impossible to guess how the taxpayers' incentives could change, if the model would become general. *El coste de mantener las prestaciones de un Estado como Noruega*, BBVA, June 2017.

[33] Segura Alastrué, M.: 'Los robots…', cit., p. 178.

[34] International Monetary Fund: 'Tackling Inequality', *IMF Fiscal Monitor*, October 2017, p. X. Executive summary available at http://www.imf.org/en/Publications/FM/Issues/2017/10/05/fiscal-monitor-october-2017 (last access 1 April 2018).

Other voices claim for modelling the technology instead, for policies to increase economic growth and improve jobs for all, by investing in education, research and development, and infrastructures[35].

Noticeably, the effects of UBI will vary depending on the country. The developing countries may use it to reinforce quickly their safety nets, but this would require efficient and equitable increases in taxes or cuts in spending. Whilst in developed countries, the UBI might result in a reduction of benefits for low-income households.

The UBI, financed through the general budget, might become a disincentive for the employment search and also produce a call effect. Therefore, reality imposes its transformation into a conditional basic income, limited subjectively (e.g. a specific group of beneficiaries depending on age), quantitatively or temporally. Other believe that a specific tax on robots could be a collateral effect, and defend that it should be only a transitional tax with earmarked revenue[36]. An alternative could be a negative tax on income, to substitute the benefits not depending upon contributions, for all the citizens below the poverty line[37].

The legislator should not look for extreme solutions when the social alarmism may put at risk traditional legal institutions whose continued existence must be preserved. It is necessary to find a consensus on the extension of the solidarity principle while shaping the relation among technology, social processes and regulation.

V. CONCLUSIONS

In view of the legal problem for which a solution is sought, there are various conceptual approaches to Robotics and robots. Although a certain consensus exists as to the characteristics which these devices must possess in order to be considered robots,

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[35] Brynjolfsson, E.; Mcafee, A.: *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, W. W. Norton & Company, New York, 2014. Taxing robots seems easier to include in an electoral programme, than an increase of investment in R+D+i and education. Segura Alastrué, M.: 'Los robots…', cit., p. 183.

[36] This could lead to double taxation of capital, and should not be admitted remaining unmoved. Alastrué, M.: 'Los robots…', cit., pp. 174, 176 and 184.

[37] Rodríguez Márquez, J.: 'La justicia tributaria. ¿Cómo puede el sistema fiscal contribuir a disminuir la desigualdad?', *VI Encuentro de Derecho Financiero y Tributario* (on 'Tendencias y retos del Derecho Financiero y Tributario'), Instituto de Estudios Fiscales, Madrid, 27 February 2018.

their functionality (we could say multi-functionality) and the degree of interaction with humans allow us at this stage to adopt a more restrictive concept (geared towards the industrial sector) and a broader concept (with regard to AI systems added to robots).

The legal problems spill over into various disciplines or areas of knowledge, which come together to seek solutions to the effect of robots in the labor market. When robotization in the labor market means the replacement of human jobs, tasks and activities by robots, ethics should be used as a starting point to reflect on the principles, scope and methods of regulatory intervention needed to safeguard human rights, i.e. those inalienable rights which derive from human dignity.

Nevertheless, regulation, in its most continental sense, i.e. hard law, cannot be designed from a perspective as defense or barrier against robotic technological innovation, but should rather be geared towards formulating measures which provide certainty to all of those involved on the basis of the principle of socially and legally responsible robotic innovation. To this end, based on the fundamental rights enshrined in the EC, and now in the European Pillar of Social Rights, it is necessary for everybody, public authorities and social partners, to promote legislation which balances the guarantee of entrepreneurial freedom with that of workers' rights.

From this dual perspective, legislation should go further in guaranteeing the employability of humans and balance the incentives for launching highly technologized activities and companies against the loss of workers in sectors which are reconverting from their traditional model towards more technologically-based activities. In this respect, it will be necessary to offer, at least in the transition phase, financial incentives for those companies that truly and effectively invest in the technological training of their workers.

Furthermore, with regard to the labor relationship, Labor Law needs to consider the possibility that an ('intelligent') robot can be considered as a worker. It may be endowed with a certain employment status but it cannot be legally considered as a salaried or self-employed worker. Labor Law is based on human work and a robot, even one with a high dose of AI, cannot be considered as such.

If we use this fundamental fact as a starting point, robotics has many implications for the direct or indirect regulation of working conditions, for rights and

obligations, for both the entrepreneur and the worker, and from both a labor and fiscal perspective.

The starting point for the analysis is the principle of equality and non-discrimination, i.e. the real and effective equality of people, of the groups of people who are vulnerable to automation or robotization. Thus, these cannot become a direct or indirect cause of discrimination; technological neutrality cannot entail a disadvantage or barriers for certain groups of workers. In this respect, and also in the transition phase, as an exceptional, limited and conditional measure, it is necessary to reflect on the quota of humans in companies and reasonable adjustment measures for those groups which are especially vulnerable, including older workers.

On the basis of this first reflection, we need to adapt labor legislation as it applies to workers' rights and obligations. Both from the perspective of guaranteeing people's employability more than jobs themselves (which will affect the direction taken by legislation relating to the replacement effect, i.e. the replacement of humans by robots) and of guaranteeing the rights of workers in their interaction with robots in the workplace (cooperation between them).

All the expected public policies will probably have an impact on the Financial and Tax Law; but, at the same time, this discipline will condition their actual applicability in practice. The States will have to to allocate rights and responsibilities among human beings for the actions of no-human beings, fighting inter-personal and inter-national inequality, through strengthened cooperation. The hight costs of a universal basic income, now at an experimental phase, could be publicly funded (through tax measures or cuts in spending), and/or even privately (if there could be an particular interest, i.e. in eliminating candidates for other competitor?). In parallel, the idea of a more limited conditional basic income emerges for practical budgetary reasons. However, it will entail the need of proportionate justification, in order not to breach constitutional or EU principles. The financial and tax regulation should always look for a balance between technological and social progress.

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